



# Report on Norwegian Cal/Val Activities

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Norwegian Space Centre

Agenda Item #

WGCV Plenary # 40

Canberra

March 14 - 18, 2016

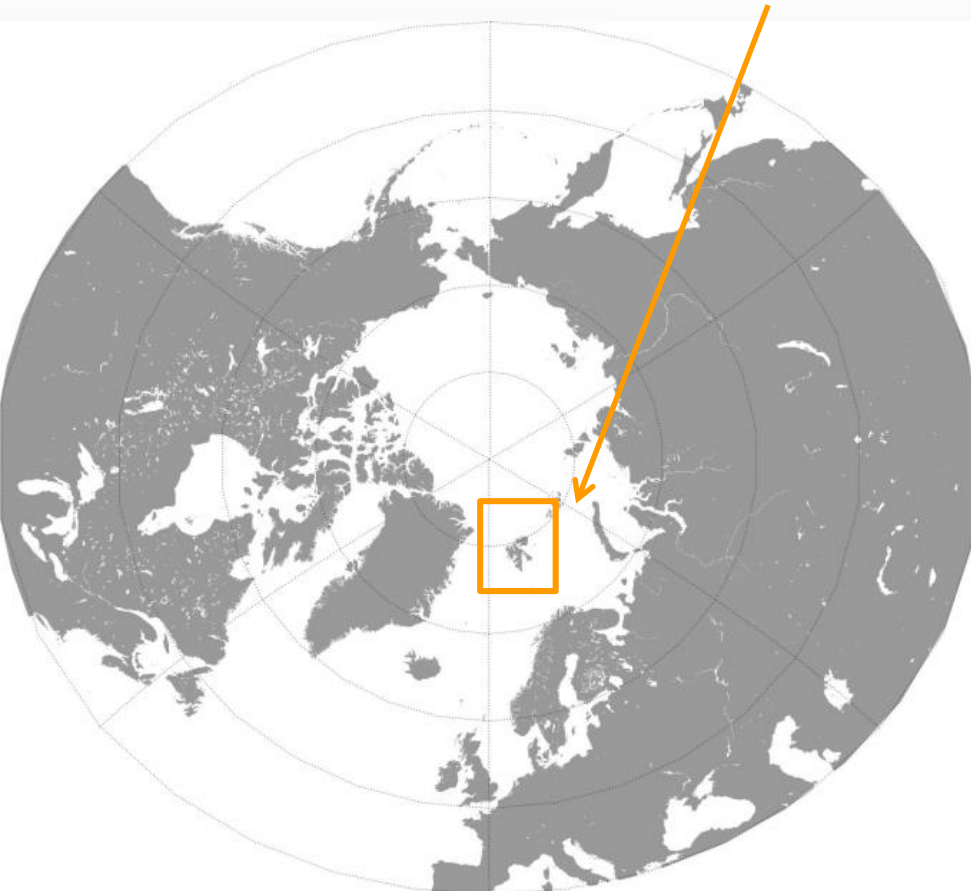
**Working Group on Calibration and Validation**





## Svalbard Integrated Arctic Observing System (SIOS) – update

The SIOS area

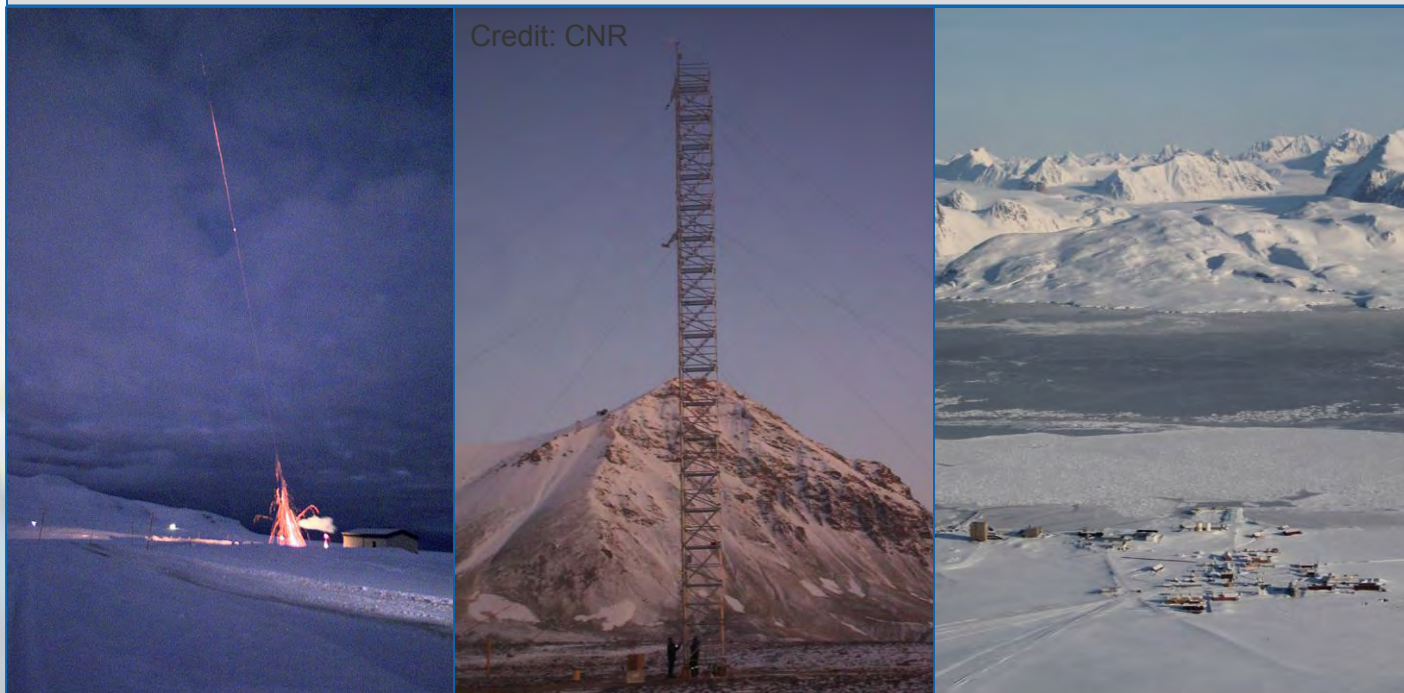


### Timeline:

- Preparatory phase: 2010 – 2014
- Implementation phase: 2015 – 2017
- Upgrade phase: 2018 – 2019
- Operational phase: 2020 →



SIOS builds on the extensive research installations and observation capacity already in place by many international research institutions in Svalbard.



The SIOS Research Infrastructure (RI) will continue to be owned and operated by each individual partner of SIOS.





## The central coordinating and integrating unit

- 5 positions developing the core services
  - Data Management
  - Remote Sensing (including developing Svalbard towards a supersite for Cal/Val)
  - Information services – logistics, training and outreach
  - Open access to RI
  - Web portal - One entrance
    - the place where all services are integrated and visualised



## News and information

5. February 2016: As the MATCH campaign proceed; user statistics shows increased activity on the server.

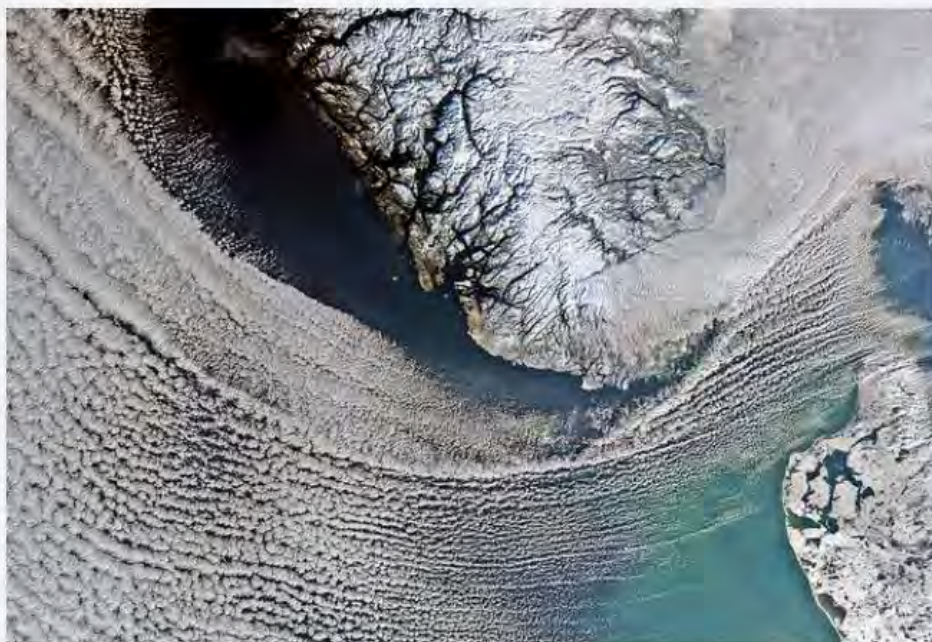
The figure contains two bar charts. The left chart, titled 'Unique user logins', displays the number of unique users for various services. The y-axis ranges from 0 to 36. The x-axis lists services: ssh, ftp, http, https, telnet, rsh, rlogin, rcp, scp, and sftp. The right chart, titled 'ssh and ftp logins', displays the total number of logins for ssh and ftp across different categories. The y-axis ranges from 0 to 600. The x-axis lists categories: All, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, and 2021. The bars are colored blue for ssh and orange for ftp.

Service	Unique user logins
ssh	32
ftp	36
http	32
https	30
telnet	24
rsh	16
rlogin	34
rcp	32
scp	34
sftp	36

Category	ssh logins	ftp logins
All	100	200
2013	100	200
2014	100	200
2015	100	200
2016	100	200
2017	100	200
2018	100	200
2019	100	200
2020	100	200
2021	100	200

21 January 2016: The MATCH campaign is ongoing. Data are uploaded to zardoz on a daily basis.

15.October 2015: Data from AVDC and NDACC are mirrored to EVDC on a daily basis.







MET and NILU participate in the ESA aerosol cci phase 1 + 2 ( --- 2017)

## MET

Climate Research Group / EO science team (Independent Validation experts)

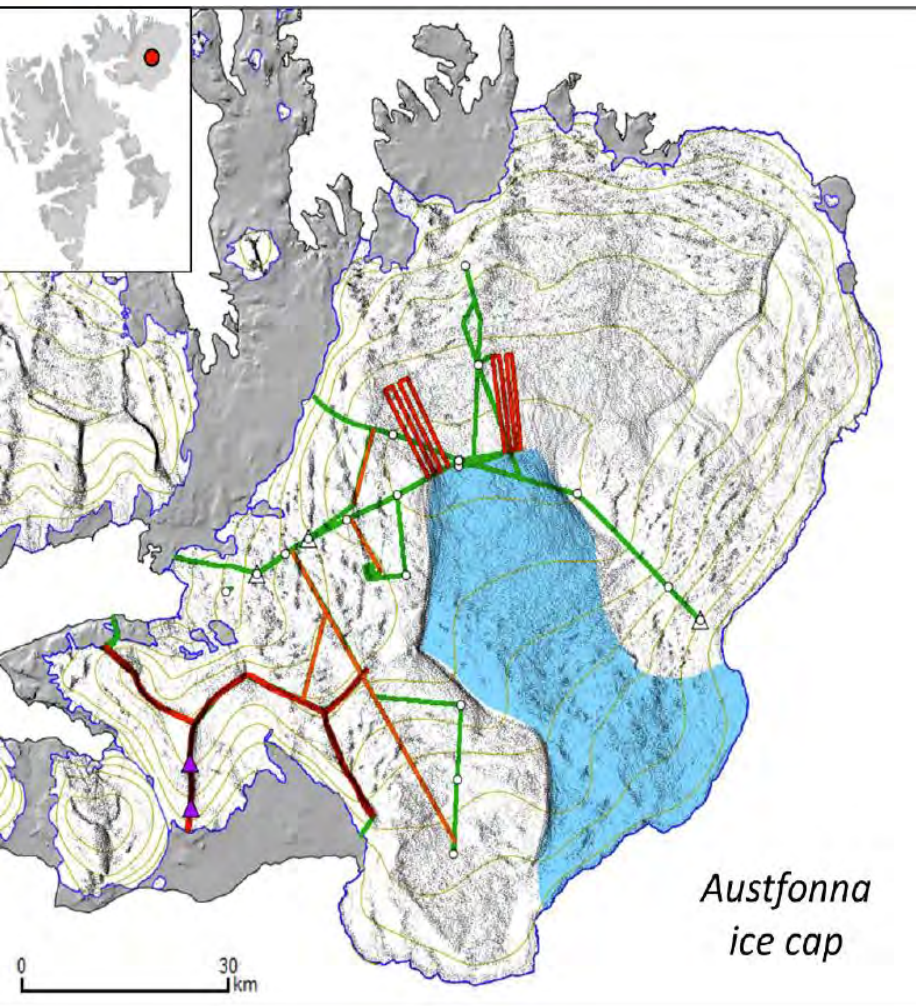
- Lead user involvement
- Inter-comparison to model datasets (AEROCOM)
- LEVEL 3 validation AATSR/IASI, Aerosol type validation
- *User case studies: trends in natural, in particular coarse mode aerosol (planned)*

## NILU

EO science team (Independent Validation experts)

- **Validation of stratospheric extinction from GOMOS**
- **Validation of aerosol (AOD) uncertainties**
- **Validation of aerosol layer height (dust, biomass burning)**
- **Cross-ECV consistency analysis**

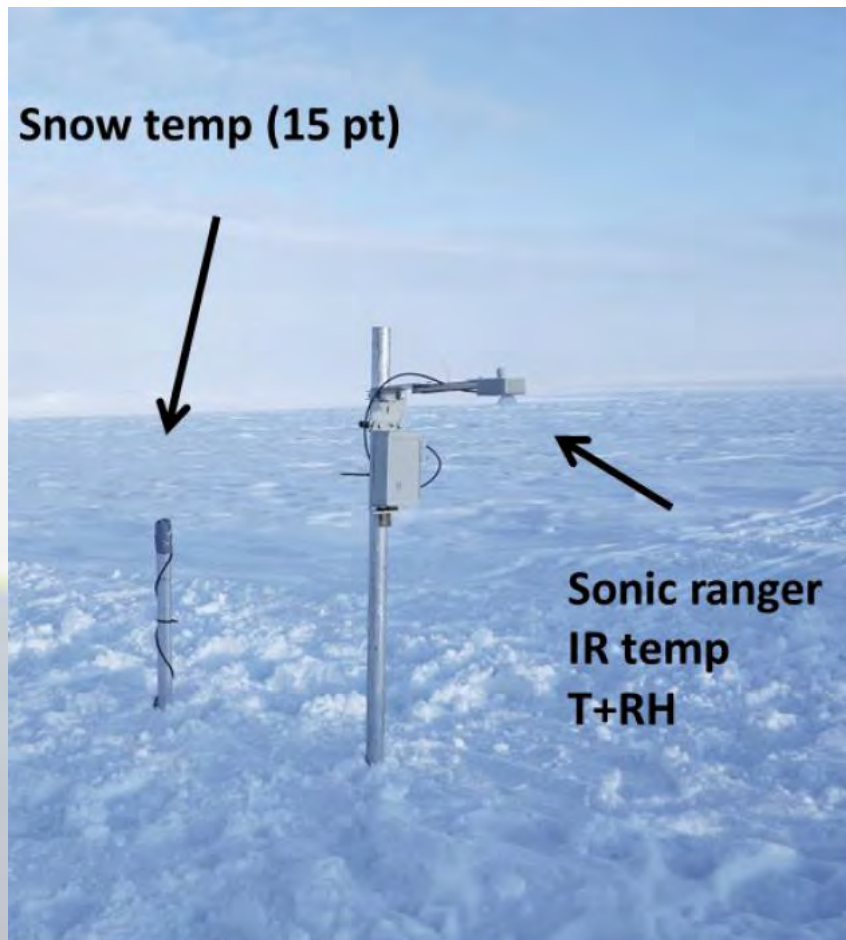
- Consortium formed by the Norwegian Polar Institute (NPI) and the Department of Geosciences at the University of Oslo (UiO)
- Glaciological investigations on Austfonna, Svalbard
  - Successful fieldwork yearly since 2004
  - 2-3 weeks in April/May when snow thickness usually is at its maximum.
- Included as test area for the Cal/Val of CryoSat-2
- Cal/Val activities described in ESA document CryoVEx Campaign Implementation Plan



- **Small black dots:** the point of closest approach (POCA) for all available CryoSat-2 elevation measurements since the launch in 2010
- **In red:** Measured ground-profiles of GPS and GPR for detailed surveys in areas with a high density of POCA data
- **In orange** for repeats of historic ICESat profiles
- **In green** for the traditional surface mass-balance transects.
- Permanent installations are shown as **white circles** for mass-balance stakes, **white triangles** for long-term automatic weather stations, and **purple triangles** for two weather/snow monitoring stations installed in 2015 for continuous air-snow temperature logging and surface ranging in a high-density POCA area.



# Design of weather/snow monitoring stations



The left stake has a string of thermistors for logging air-snow temperatures at 15 different levels spaced at 10 cm interval.

The right stake contains an ultra-sonic ranger for surface ranging and a basic automatic weather station that measures infrared/air temperature, humidity and global radiation.



**N-ICE**2015  
NORWEGIAN YOUNG SEA ICE CRUISE

**N-ICE2015**

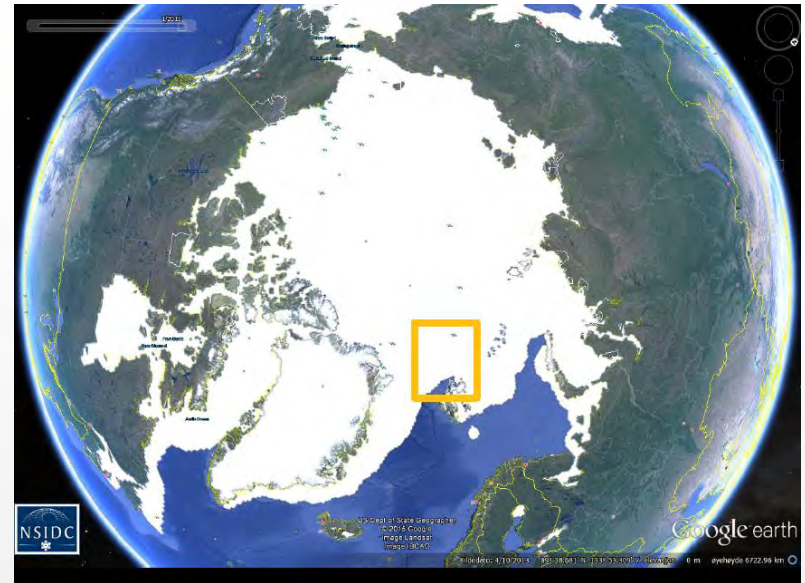


**Norwegian Young Sea ICE cruise 2015**



© Jago Wallenschus N-ICE 2015

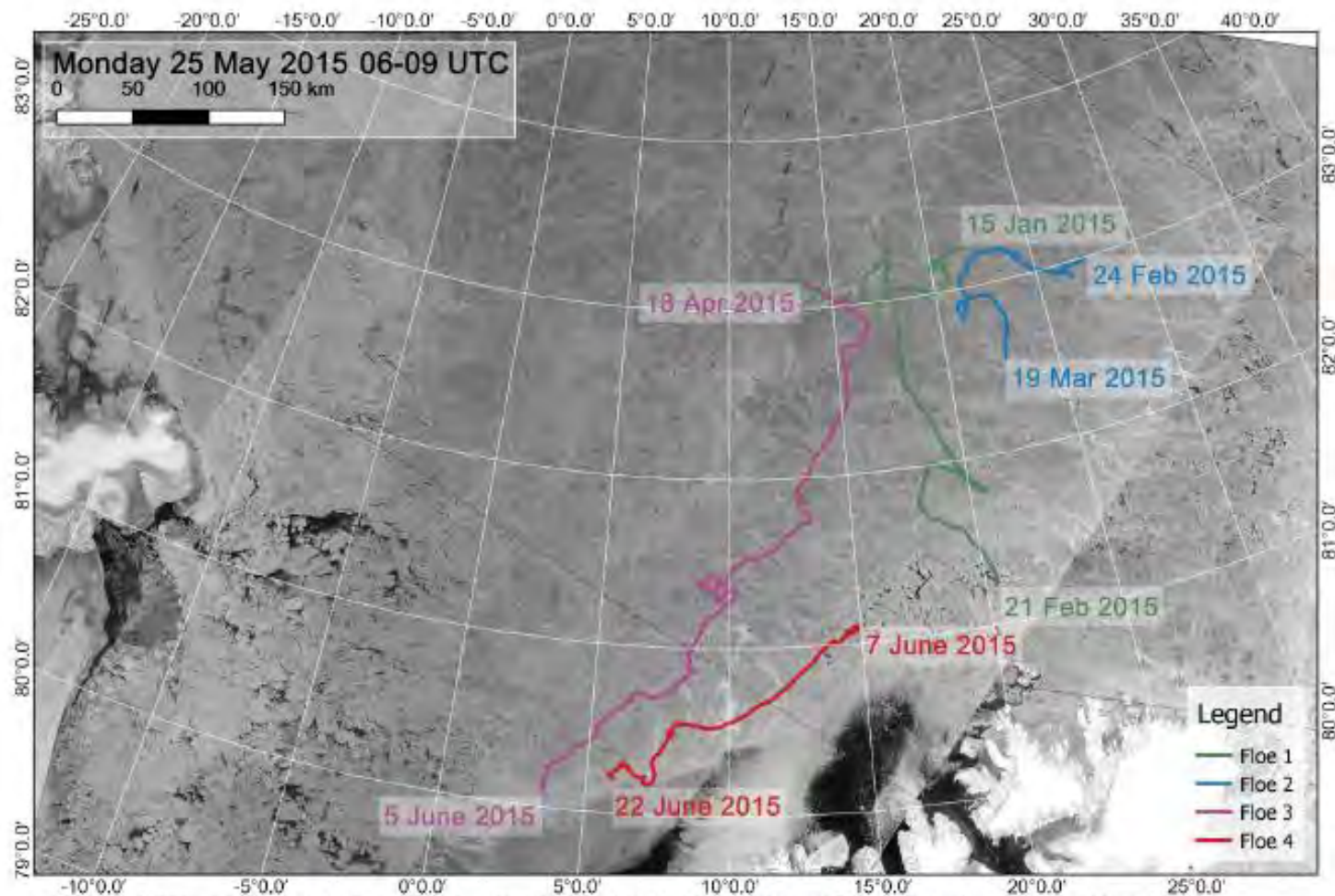
- Primary objective:  
To understand the effects of the new thin, first year, sea ice regime in the Arctic on energy flux, ice dynamics and the ice associated ecosystem, and local and global climate.







# Drift paths

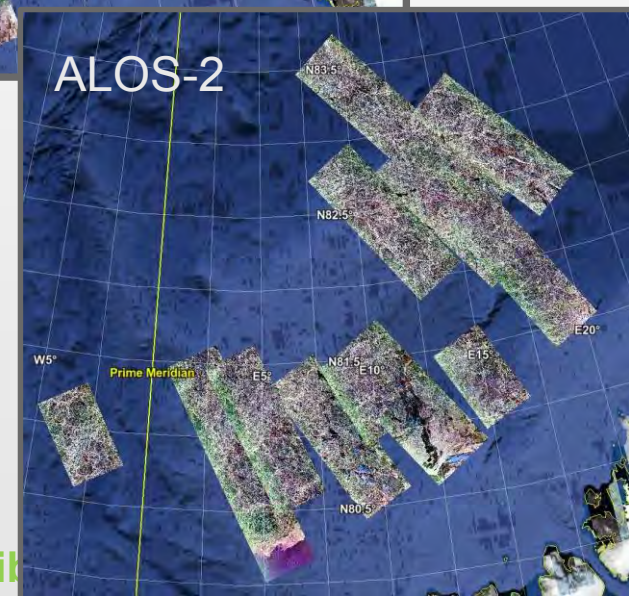
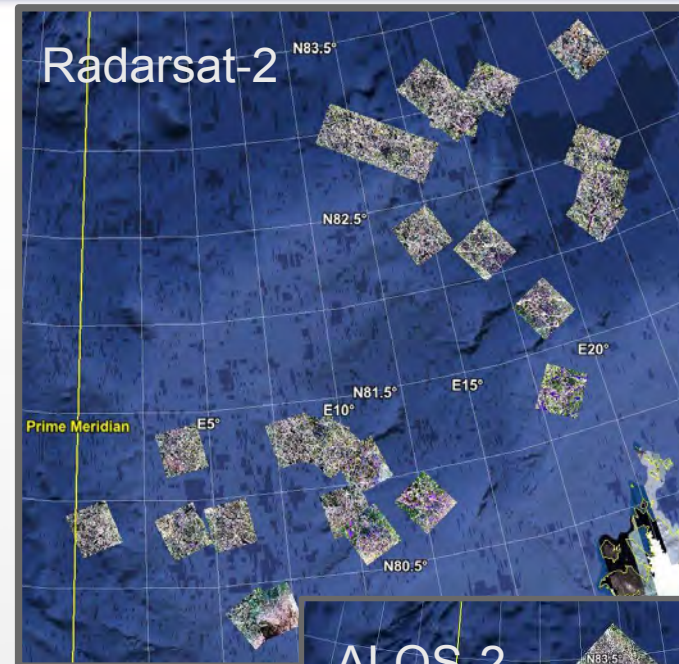


RADARSAT-2 images provided by NSC/KSAT under the Norwegian-Canadian RADARSAT agreement 2013 © MacDonald, Dettwiler and Associates.

Map created by the Norwegian Polar Institute / Max König

# Comparison of radar satellite data

- N-ICE
  - January 2015 – June 2015
- Data gathered include;
  - ALOS-2 Palsar (QP, L-band)
  - Radarsat-2 (QP, C-band)
  - TerraSAR-X (Dual, X-band)
- Two days with 3 different wavelengths QP
- Multiple days has overlap between at least 2 different wavelengths



Acknowledgement;  
TerraSAR-X data © 2011 & 2015 DLR - All rights reserved.  
RADARSAT-2 Data and Products© MDA LTD. (2011 & 2015) - All rights reserved.  
ALOS-2 data © 2015 ALOS- All rights reserved.

Working Group on Calib

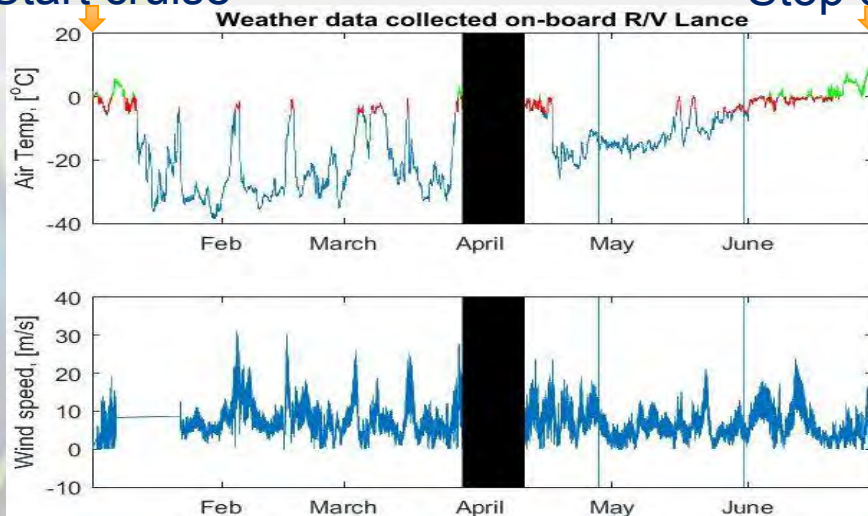




- Ground truth
  - Electromagnetic (EM) soundings
    - o From Helicopter
    - o Ground based
  - In-situ; coring
- On-board R/V Lance
  - Meteorological observations

Start cruise

Stop cruise



### Helicopter EM



